

REMARKS

This responds to the Office Action dated April 4, 2007.

Claims 1-34 are amended, and no claims are canceled or added; as a result, claims 1-34 are pending in this application.

Objections to the Claims

Claims 2-8, 10-16, 18-20, 22-24, 26-30, and 32-34 were objected to because of informalities. The claims were amended to correct the informalities in the manner suggested by the Examiner. Applicant respectfully requests withdrawal of the objection and allowance of claims 2-8, 10-16, 18-20, 22-24, 26-30, and 32-34.

§101 Rejection of the Claims

Claims 1-21 were rejected under 35 USC § 101 as being directed to non-statutory subject matter. Applicant respectfully traverses the rejection.

Claims 1 and 9 are amended to resolve the rejection under § 101. Support for the amendments is found generally within the specification (*see e.g.*, ¶ 0025 of the specification).

The present claims do provide a tangible result that is useful and concrete. The tangible result is a channel state estimation or a channel response function for the current channel. As indicated in the Background section, without knowledge of the channel information, the transmitter may spend more information than is necessary for data and other information between the transmitter and receiver. The achievement of a more accurate estimation of the channel state is a useful, concrete and tangible result.

The Background section also states that a typical transmitter does not have the benefits of channel information when making adjustments. The present invention allows that information to be provided to the transmitter. Thus, the result claimed is at least as useful, concrete and tangible as the result in *State Street*,¹ a final share price momentarily fixed for recording and reporting purposes. Providing a channel state estimation or a channel response function for the channel

¹ *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 149 F.3d 1368, 1373, 47 USPQ2d 1596, 1601-02 (Fed. Cir. 1998).

clearly provides a useful concrete and tangible result – channel information about the communication channel.

Applicant respectfully requests reconsideration and allowance of claims 1-21.

§102 Rejection of the Claims

Claims 1, 3, 4, 8, 9, 11, 12, 16, 17, 20, 21, 24, 25, 27, 31, and 34 were rejected under 35 USC § 102(b) as being anticipated by Kadous et al. (U.S. 2003/0095508 A1, “Kadous”).

Because the publication date of Kadous and the parent application of Kadous (U.S. Patent Application Ser. No. 09/991,039) is May 22, 2003, which is less than one year prior to the filing date of the present patent application, Applicant is proceeding under the assumption that the Office Action intended to reject the claims using § 102(c) rather than § 102(b).

Claims 1, 9, 17, 21, 25, and 31 are amended. Support for the amendments is found generally within the specification (*see e.g.*, ¶¶0021 and 0023 of the specification). Applicant respectfully traverses the rejection as applied to the present claims.

Applicant cannot find in Kadous any disclosure of, among other things, generating a channel state information packet to be transmitted back to the transmitter, wherein the packet includes either the quantized channel response function or the quantized residual value of the channel response function according to a connection time between the transmitter and a receiver,

as presently recited in claim 1 and similarly recited in claims 9 and 25, or

parsing a channel state information packet received from a device after transmitting a signal to the device to obtain a quantized channel response function of the signal wherein the channel state information packet includes either the quantized channel response function or a quantized residual value of the channel response function depending on a connection time with the device,

as presently recited in claim 17 and similarly recited in claims 21 and 31.

Instead, Kadous states that the feedback information may include the rate, the channel estimates provided by the channel estimator 164, and acknowledgement (ACK) or negative acknowledge (NACK),² but does not disclose a channel state information packet [that] includes

² Kadous, ¶0027.

either the quantized channel response function or a quantized residual value of the channel response function.

Applicant respectfully requests withdrawal of the rejection and reconsideration and allowance of claims 1, 3, 4, 8, 9, 11, 12, 16, 17, 20, 21, 24, 25, 27, 31, and 34.

§ 103 Rejection of the Claims

1. Claims 2, 5, 10, 13, 18, 22, 26, 28, and 32 were rejected under 35 USC § 103(a) as being unpatentable over Kadous in view of Davidsson et al. (U.S. 2002/0101840 A1, "Davidsson"). Applicant respectfully traverses the rejection. The Office Action fails to establish a *prima facie* case of obviousness because the proposed combination of Kadous and Davidsson does not teach or suggest all of the elements presently incorporated in the claims.

Claims 2 and 5 depend on base claim 1, claims 10 and 13 depend on base claim 9, claim 18 depends on base claim 17, claim 22 depends on base claim 21, claims 26 and 28 depend on base claim 25, and claim 32 depends on base claim 31. As set forth above, Kadous does not teach or suggest all of the elements of the base claims. Davidsson fails to teach or suggest those claim elements missing from Kadous.

Also, the M.P.E.P. states that Graham v. John Deere Co. should be followed in the consideration and determination of obviousness under 35 U.S.C. § 103. The factual inquiries enunciated in Graham include ascertaining the differences between the prior art and the claims at issue. The content of the prior art is determined at the time the invention was made to avoid hindsight.³ One of ordinary skill in the art at the time of the invention would not have reasonably looked to combine Davidsson with Kadous.

The Office Action states that it would have been obvious ... to combine the teaching of Davidsson with the system of Kadous for the benefit of achieving a wireless packet system that includes a timing drift compensation technique.⁴ However, Davidsson refers to a radio receiver that includes a timing correction unit that performs timing drift compensation. Kadous refers to feedback information sent back to the transmitter to adjust processing.⁵ Thus, one of ordinary skill in the art at the time of the invention would not have reasonably looked to Davidsson to

³ M.P.E.P. § 2141 I.

⁴ Office Action, pg. 6.

⁵ Kadous, ¶0027.

solve a problem in Kadous because Davidsson solves the problem of timing drift compensation in the receiver, leaving no reason to send feedback information to adjust processing as in Kadous.

Applicant respectfully requests reconsideration and allowance of claims 2, 5, 10, 13, 18, 22, 26, 28, and 32.

2. Claims 6, 7, 14, 15, 19, 23, 29, 30, and 33 were rejected under 35 USC § 103(a) as being unpatentable over Kadous in view of He et al. (U.S. 2004/0005010 A1, "He"). Applicant respectfully traverses the rejection. The Office Action fails to establish a *prima facie* case of obviousness because the proposed combination of Kadous and He does not teach or suggest all of the elements presently incorporated in the claims.

Claims 6 and 7 depend on base claim 1, claims 14 and 15 depend on base claim 9, claim 19 depends on base claim 17, claim 23 depends on base claim 21, claims 29 and 30 depend on base claim 25, and claim 33 depends on base claim 31. As set forth above, Kadous does not teach or suggest all of the elements of the base claims. He fails to teach or suggest the missing elements.

For example, Applicant cannot find in He any teaching or suggestion of among other things,

generating a channel state information packet to be transmitted back to the transmitter, wherein the packet includes either the quantized channel response function or the quantized residual value of the channel response function according to a connection time between the transmitter and a receiver,

as presently recited in claim 1.

The Office Action states that He includes subtracting a channel estimate from the channel response function to provide a residual value of the channel response function.⁶ Applicant respectfully disagrees with this characterization of He. Instead, He refers to subtracting a current estimate of the determined measure of intercarrier interference (ICI) from an output of a Fourier-based transform step performed in a receiver of the multicarrier modulation system, to produce an adjusted output of the Fourier-based transform step.⁷ Thus, He subtracts ICI from an estimate

⁶ Office Action, pg. 9.

⁷ He, ¶0035.

of the channel response to obtain a current channel response⁸ instead of “wherein a channel estimate is subtracted from the channel response function to provide the residual value.”

Also, the differences in the references would have made it unlikely that one of ordinary skill at the time of the invention would look to combine He with Kadous. The Office Action states that it would have been obvious ... to combine the teaching of He with the system of Kadous for the benefit of achieving a system that includes equalization for accurately determining the frequency offset between the transmitter and receiver.⁹

However, He states that “Data equalization is performed using the channel response iteratively calculated as described. The implied ICI is constructed, and the output from the FFT in the OFDM receiver is adjusted to determine an estimate of transmitted OFDM data.” Kadous refers to feedback information sent back to the transmitter to adjust the processing.¹⁰ Thus, one of ordinary skill in the art at the time of the invention would not have reasonably looked to He to solve a problem in Kadous because He solves the problem of equalization in the receiver while Kadous describes adjustment in the transmitter.

Applicant respectfully requests reconsideration and allowance of claims 6, 7, 14, 15, 19, 23, 29, 30, and 33.

⁸ He, ¶0036.

⁹ Office Action, pg. 9.

¹⁰ Kadous, ¶0027.

RESERVATION OF RIGHTS

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. However, Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612-371-2172) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date July 3, 2007

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 3rd day of July 2007.

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